6061 0.750"

Quality Control

| Work Order ID 122751 Tuesday, July 22, 2014 8:45:31 AM | | | | | | | | | Page 1 | | | |
|--|---------------------------|--------------------------|------------------|----------------------|-------------|--------|--------------|---------------|------------|--------------|------------------|----------------|
| Item ID: Revision ID: | D3490-3 | | . A | Accept | *N900 | 040 | 100 |) * | Setup | | *N | S1* |
| Item Name: | Cross Bolt S _J | pacer | | | | | | | | Stop | *N | S2* |
| Start Date: | 7/21/14 | Start Qty: 50.00 | *50* | | Cust Item 1 | D: | | | | | | |
| Required Date: | 7/21/14 | Req'd Qty: 50.00 | *50* | | Customer: | | | | | | | |
| Reference: | | | • • | | | | _ | | _ | C 4 4 | | |
| Approvals: | Process Pl | lan: MC5 | Date: 14-07-23 | Tooling: | D | ate: | | | Run | Start | ~1/1 | R1* |
| | QC: | | Date: | SPC (Y/N): | D | ate: | | | | Stop | *N | R2* |
| Sequence ID/ Work Center ID |) | Operation Description | | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Rej Qty | • | Reject Number | Insp. Stamp |
| Draw Nbr | Re | vision Nbr | | | | | | | | | | • |
| D3490 | Re | v A | | | | | | | | | | |
| 100 | | | | 0.00 | | | | DAS | | | , | |
| *100* | | Hardinge CNC LATHE | SMALL | | | | | 02 9-89 | | | 14- | 07-29 |
| Hardinge | | Memo | | 0.00 | | | | 9-09 | | ٠ | | |
| Hardinge CNC Lathe | e Small | FOLIO REV | | G D3490 | | | • | | | | | |
| 110 | | QC2- Inspect parts off n | nachine FAI/FAIB | 0.00 | | | | DAS | | | | |
| *11 0 * | | Memo | | 0.00 | | • | | 02 9.89 | 39 | 1 | 4 07 | -29 |
| Quality Control | | | | | | | | | | | | |
| 120 | - 1 | QC8- Inspect parts - sec | ond check | 0.00 | | | | | | | | DAS |
| *120* | | | | 0.00 | | | | | | | | 25 \\\-29 |
| QC | | Memo | | 0.00 | | | | | | | | |

| DQA: | | _ Date: | | | | | | _ | | | | *DART |
|-----------------------|----------------|-------------|--------|-------|--|-----|----------|----------------------------|--------|---------------|---------------|--------------------|
| | | _ | | | WORK ORDER NON- | -CC | ONFO | RMANCE / UPDATE | | Louis | | AEROSPACE |
| QA Closed: | . | Date: | | | | | | | wor | k Order up | date only | |
| Work Orde | ır. | | | | DISPOSITION | | | AGAINST | DEP | ARTMENT/ | PROCESS | |
| Work Orac | | | | | Rework | | | Skid-tube Crosstube | | | Water Jet | Engineering |
| Part N | lo. | | | | Scrap | | l | Machining Small Fab | | Proc | d. Eng. Coor. | Quality |
| | | | | | Use-as-is | | | noforming Finishing | | Rec/Stor | e/Packaging | Other |
| NCR N | lo. | | | | Suspected Unapproved | | | Large Fab Composite | | | Supplier |] |
| | | | | | | | | | | | • | |
| Root | | | | Desci | ription of work order update | l | nitial | Action | | Sign & | | |
| Cause | Date | Step | Qty | | or non-conformance | Ch | ief Eng | Description | | Date | Verification | QC Inspector |
| Design | | | | | | | | | | | | |
| Doc/Data | | | | | | | | | | | | |
| Equip/Tooling | _ | ÷ | | | | | | و المله الأرس المدياسي " | | | | |
| Handling/Pre | | | | | | | | | Ì | | | |
| Material | _ | , | , , | | | | | , | | | | |
| Operator | | | | ۳. | | | | | | | -5 | |
| Offset/Setup | | ļ | | | graph (Control of Control of Cont | | | | | | | |
| Process | | ľ | | | | | | | | | | |
| Supplier | | | | | | | | | | | II | |
| Training Transport | \dashv | | | | | | | | | | | |
| Unapproved | | | | ŀ | | | | | | | | |
| onapproved | | ٠ | 1 | 1 | | FA | ULT CA | TEGORY | | | | |
| Landir | ng Gear | | ; | | General | | | | | | | |
| . [| Bending | • | | • | Bend | | Folio/F | Program | \Box | Outside Dim | ensions | Pressure/Forced |
| İ | Centre N | ot Conce | ntric | | BOM/Route | | Grain | • | | Over/Under | tolerance | Set-up |
| | Cracks | | | | Broken/Damage/Defect | | Hardwa | are | Πı | Part Incorred | :i | Temperature/Cure |
| Ì | Crimp/Ki | nk/Ripple | e/Wave | | Burrs | Г | Inspect | ion Incomplete/Unqualified | | art Lost/Mi | ssing | Weld |
| | Cuffs | | | | Contamination | | Instruct | tions Incomplete/Unclear | | Part Moved | | Wrong Stock Pulled |
| 3.4 | Crushing | | | | Countersink | | Misalig | gned/off center | | Positioned V | Vrong | - |
| | Heat Tre | at | | | Cut Too Short | | Mislabe | eled | | ower Loss/ | Surge | Other |
| | Inspection | on Strip in | Tube | | Drawing | | Misrea | d | _ | | | |
| | Marks/C | hatter | | | Drill Holes | | Off-set | | _ | | | |
| | Turning S | Sequence | 9 | | Finish | | | Calibration | _ | | | |
| | Wave/Tv | wist in Tu | be | | Fit/Function | | Out of | Sequence | | | | |

| W | ork | Order | ID | 122751 |
|---|-----|-------|----|--------|
|---|-----|-------|----|--------|

Packaging

122751

Page 2

Tuesday, July 22, 2014 8:45:31 AM Accept D3490-3 Item ID: *N900040100* Setup Start **Revision ID:** Stop **Item Name:** Cross Bolt Spacer *50* **Start Oty:** 50.00 **Start Date:** 7/21/14 **Cust Item ID:** Required Date: 7/21/14 **Req'd Qty:** 50.00 **Customer:** Reference: Run Date: **Approvals:** Process Plan: Tooling: Date: Stop SPC (Y/N): Date: Date: Tool # Plan Reject Sequence ID/ Set Up/ Tool ID Accept Reject Insp. **Operation** Work Center ID Description Code Qty Qty Number Stamp **Run Hours** 124 0.00 *194* 0.00 HandFinish Memo CLEAN CROSSBOLT SPACER WITH ALUMINUM CLEANNER Hand Finishing QC5- Inspect part completeness to step on W/O 0.00 126 Ø BE 14-08-15 *126* 0.00 Memo Quality Control Identify as per dwg & Stock Location 0.00 50 8 BE 14-08-15 130 *130* 0.00 Packaging Memo

STOCK IN SKIDTUBE CELL

| DQA: | | | Date: | | | | | | | | | | | TART |
|---------------|---------------|-------------|-------------|----------|----------|------------------------------|----------|--------------|--------------------|------------|----------|---------------|---------------|--------------------|
| | | | | | | WORK ORDER NON- | -CC | ONFO | RMANCE / UF | | | | | AEROSPACE |
| QA Closed: | | | Date: | | | | | | | <u> </u> | Wor | k Order up | date only | |
| Work Orde | or. | | | | | DISPOSITION | | | | AGAINST I | DEPA | ARTMENT/ | PROCESS | |
| WOIK Olde | - | | | | | Rework | | | Skid-tube | Crosstube | | | Water Jet | Engineering |
| Part N | lo. | | | | | Scrap | | | Machining | Small Fab | \dashv | Prod | l. Eng. Coor. | Quality |
| | - | | | | | Use-as-is | | | noforming | Finishing | | | e/Packaging | Other |
| NCR N | ١o. | | | | | Suspected Unapproved | | | Large Fab | Composite | | | Supplier | |
| | | | | | | | | | | | | | | ., |
| Root | | | | | Desc | ription of work order update | | Initial | Act | | | Sign & | | |
| Cause | | Date | Step | Qty | | or non-conformance | Ch | ief Eng | Descr | iption | \perp | Date | Verification | QC Inspector |
| Design | _ | | | | | | | | | | | | | |
| Doc/Data | | | | | | | | | | | | | | |
| Equip/Tooling | _ | | | | | | | | | | | | | |
| Handling/Pre | Щ | | | | | | İ | | | | | | | |
| Material | | | 1 | | | | | | | | | | | |
| Operator | | | | | | | | | | | | | | |
| Offset/Setup | | | | | | | | | | | | | | |
| Process | | | | | | | | | | | | | | |
| Supplier | | | | | | | İ | | | | | | | |
| Training - | \dashv | | | | | | | | | | | | | |
| Transport | \dashv | | | | , | | | | | | | | | |
| Unapproved | | | L | <u> </u> | | | EAI | III T CA | TEGORY | | | | | 1 |
| Landii | na G | ioar | | | | General | FA | OLI CA | IEGONI | | | · | | |
| Lanui | | Bending | | | Г | Bend | | Teolio/s | Program | ſ | \Box | Outside Dim | ensions [| Pressure/Forced |
| | _ | Centre No | nt Concer | ntric | | BOM/Route | - | Grain | rogram | ŀ | _ | Over/Under | <u> </u> | Set-up |
| | - | Cracks | or concer | ittic | | Broken/Damage/Defect | - | Hardwa | are | • | | Part Incorrec | — | Temperature/Cure |
| | - | Crimp/Kir | nk/Rinnle | /Wave | | Burrs | | 4 | ion Incomplete/Ur | ngualified | — | art Lost/Mi | ├ | Weld |
| | - | Cuffs | , pp. (| , | | Contamination | H | - 1 ` | tions Incomplete/U | · . | | Part Moved | ĭ F | Wrong Stock Pulled |
| | _ | Crushing | | | | Countersink | \vdash | 4 | gned/off center | ŀ | — | ositioned W | ــــ rong/ | - |
| | $\overline{}$ | Heat Trea | it | | <u> </u> | Cut Too Short | | Mislab | =" | | | ower Loss/: | _ | Other |
| | $\overline{}$ | Inspection | | Tube | <u> </u> | Drawing | | Misrea | | · | | | | |
| | | Marks/Ch | atter | | | Drill Holes | | Off-set | | | _ | | | |
| | | Turning S | equence | | | Finish | Г | Out of | Calibration | | _ | | | |
| | | Wave/Tw | ist in Tub | oe . | | Fit/Function | | Out of | Sequence | | _ | | | |

| W | ork | O | r | d | eı | r | I | L |) | 1 | 12 | 2 | 7 | 5 | 1 |
|---|-----|---|---|---|----|---|---|---|---|---|----|---|---|---|---|
| | _ | _ | _ | _ | _ | _ | _ | _ | | _ | | _ | | | |

122751

Page 3

Tuesday, July 22, 2014 8:45:31 AM Accept Item ID: D3490-3 Setup Start *N900040100* **Revision ID:** Item Name: Cross Bolt Spacer **Start Otv:** 50.00 *50* Start Date: 7/21/14 **Cust Item ID:** Required Date: 7/21/14 Rea'd Otv: 50.00 *50* **Customer:** Reference: Start Run Approvals: Process Plan: Date: Tooling: Date: Stop Date: _____ SPC (Y/N): Date: *NR2* Accept Reject Reject Insp. Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Work Center ID Description Run Hours Code Oty Oty Number Stamp 140 QC21- Final Inspection - Work Order Release 0.00 MLS 14-08-15 *140* 0.00 Memo **Ouality Control**

| DQA: | | _ Date: | | | | | | · | | | | | *DART |
|-------------------------------|---------|--------------|--------|----------|------------------------------|----------|---------|--------------------|-----------|----------|----------------|---------------|--------------------|
| ۵۸ داغیما، | | Data | | | WORK ORDER NON- | -CC | ONFO | RMANCE / U | | ۱۸/۵ | rk Order up | date only | AEROSPACE |
| QA Clòsed: | | Date: | | | | _ | | | | VVO | ik Older up | date only | |
| Work Orde | r: | | | | DISPOSITION | | | | AGAINST | DEF | PARTMENT | PROCESS | |
| Work Orac | | | | | Rework | | | Skid-tube | Crosstube | | | Water Jet | Engineering |
| Part N | lo. | | | | Scrap | | | Machining | Small Fab | | Pro | d. Eng. Coor. | Quality |
| | | | | | Use-as-is | | Thern | noforming | Finishing | | Rec/Stor | e/Packaging | Other |
| NCR N | lo | | | | Suspected Unapproved | | | Large Fab | Composite | | | Supplier | |
| | | <u> </u> | 1 | | | | | I | | | Cian 9 | | 1 |
| Root | | 61 | | Desc | ription of work order update | l | nitial | Act | | l | Sign & Date | Verification | QC Inspector |
| Cause | Date | Step | Qty | | or non-conformance | Cn | ief Eng | Descr | iption | \dashv | Date | Verification | QC IIISPECTOI |
| Design | | | | | | | | | | | | | |
| Doc/Data | | | | | | | | | | | | | |
| Equip/Tooling Handling/Pre | - | | | | | | | | | | | | |
| Material | ╣. | | | | | | | | | | | | |
| Operator | | | | | | | | | | | | | |
| Offset/Setup | | | | | | | | | | | | | |
| Process | | | | | | | | | | | | | |
| Supplier | | | | | | | | 1 | | | | | |
| Training | | | Ì | | | | | | | | | | |
| Transport | | | | | | 1 | | | | | | | |
| Unapproved | | | | | | | | | | | | | |
| | | | | | | FA | ULT CA | TEGORY | | | | | |
| Landi | ng Gear | | | | General | | • | | | | ı | _ | 7 |
| | Bendin | 3 | | | Bend | | - i | Program | | | Outside Dim | _ | Pressure/Forced |
| | Centre | Not Conce | entric | <u> </u> | BOM/Route | <u></u> | Grain | | | \vdash | Over/Under | | Set-up |
| | Cracks | | | _ | Broken/Damage/Defect | <u> </u> | Hardwa | | | \vdash | Part Incorre | | Temperature/Cure |
| | _ | (ink/Rippl | e/Wave | <u> </u> | Burrs | | 1 ' | ion Incomplete/Ur | | _ | Part Lost/Mi | ssing | Weld |
| | Cuffs | | | <u> </u> | Contamination | _ | 4 | tions Incomplete/U | Jnclear | \vdash | Part Moved | | Wrong Stock Pulled |
| | Crushin | _ | | · | Countersink | \vdash | • | gned/off center | | | Positioned V | _ | ا |
| | Heat Tr | | | <u> </u> | Cut Too Short | | Mislab | | | | Power Loss/ | Surge | Other |
| : | | ion Strip ir | n Tube | \vdash | Drawing | L | Misrea | | | | | | |
| | Marks/ | | | <u> </u> | Drill Holes | <u> </u> | Off-set | | | | | | |
| , | | Sequence | | <u> </u> | Finish | _ | 4 | Calibration | | | | | |
| | Wave/1 | wist in Tu | be | 1 | Fit/Function | 1 | Out of | Sequence | | | | | |

Tuesday, July 22, 2014 8:45:31 AM

Work Order ID: 122751

122751

Parent Item:

D3490-3

D3490-3

Parent Item Name:

Cross Bolt Spacer

Start Date: 7/21/14

Required Date: 7/21/14

Start Qty: 50.00

Required Qty: 50.00

Comments:

IPP Rev:A New Issue 06-03-03 JLM

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| M6061T6R0.750 | | Purchased | No | | | 100 | f | 48.5981 | 0.266 | J416.1 | ,o4 | | |
| *M6061T6 | SB0 750 | * | | | | | | | ** | RI | - 14- | -07- | 29 |

6061-T6 Round Bar .750"

| Location | Loc Oty | Loc Code | |
|-----------------|-----------|----------|--------|
| MAT012 | 48.598052 | | |
| m126852 | 3.494052 | | |
| 2 m128573 | 24 | | x7 |
| 4 m129167 | 21.104 | | 49.104 |
| | • | | 1 1 |

| DQA: | | Date: | | | | | | • | | | | | "DART |
|---------------|------------|------------|----------|------|------------------------------|-----|---------|-------------------|------------|-----|--------------|---------------------------------------|--------------------|
| QA Closed: | | Date: | | | WORK ORDER NON- | -CC | ONFO | RMANCE / UI | | W٥ | ork Order up | date only | AEROSPACE |
| LA Closed. | | Date. | | | | | | - | | | <u> </u> | · · · · · · · · · · · · · · · · · · · | |
| Work Orde | or: | | | | DISPOSITION | | | | AGAINST | DEF | PARTMENT | PROCESS | |
| Work Orde | | | | | Rework | | | Skid-tube | Crosstube | | | Water Jet | Engineering |
| Part N | lo. | | | | Scrap | 1 | i | Machining | Small Fab | ┪ | Pro | d. Eng. Coor. | Quality |
| | | | | | Use-as-is | | | noforming | Finishing | | Rec/Stor | e/Packaging | Other |
| NCR N | lo. | | | | Suspected Unapproved | 1 | | Large Fab | Composite | | | Supplier | |
| | | | | | | | | | | - 1 | | | |
| Root | | | | Desc | ription of work order update | ı | Initial | i | ion | | Sign & | | |
| Cause | Date | Step | Qty | | or non-conformance | Ch | ief Eng | Descr | ription | _ | Date | Verification | QC Inspector |
| Design | | | | | | | | | | | | | |
| Doc/Data | | | | | | | | | | | | | |
| Equip/Tooling | _ | | | | | | | | | | | | |
| Handling/Pre | | | | | | | | | | | | | |
| Material | | | | | | i | | | | | | | |
| Operator | | | | | | | | | | | | | |
| Offset/Setup | | , | | | | | | | | | | | |
| Process | | | | | | | | | | | | | |
| Supplier | | | | | | | | | | | | | |
| Training | | | | | | | | | | | | | |
| Transport | | | | | | | | | | | | | |
| Unapproved | | | | | | | | | | | | | |
| | <u>.</u> | | | | | FA | ULT CA | TEGORY | | | | | |
| Landi | ng Gear | . ; | | | General | | _ | | | | 1 | | - |
| | Bending | | | | Bend | | Folio/f | Program | | - | Outside Dim | <u> </u> | Pressure/Forced |
| | Centre N | ot Conce | ntric | | BOM/Route | L | Grain | | | | Over/Under | <u> </u> | Set-up |
| | Cracks | | | | Broken/Damage/Defect | | Hardwa | are | | | Part Incorre | ├ | Temperature/Cure |
| | Crimp/Ki | nk/Ripple | e/Wave | L | Burrs | | Inspect | ion Incomplete/U | nqualified | | Part Lost/Mi | ssing | Weld |
| | Cuffs | | | | Contamination | | Instruc | tions Incomplete/ | Unclear | | Part Moved | | Wrong Stock Pulled |
| | Crushing | | | | Countersink | | Misali | gned/off center | | | Positioned V | | - 7 |
| | Heat Tre | at | | | Cut Too Short | | Mislab | eled | | | Power Loss/ | Surge | Other |
| | Inspection | n Strip in | Tube | | Drawing | | Misrea | d | | | | W | |
| | Marks/C | hatter | | | Drill Holes | | Off-set | | | | <u> </u> | | |
| | Turning : | Sequence | <u>:</u> | | Finish | | Out of | Calibration | | | | | |
| | Wave/Tv | vist in Tu | be | | Fit/Function | | Out of | Sequence | | | | | |

| DART AEROSPACE LTD | Work Order: / | 22751 |
|-------------------------------|---------------|-------------|
| Description: Crossbolt Spacer | Part Number: | D3490-3 |
| Inspection Dwg: D3490 Rev: A | | Page 1 of 1 |

FIRST ARTICLE INSPECTION CHECKLIST

| X First Article | Prototype |
|-----------------|-----------|
|-----------------|-----------|

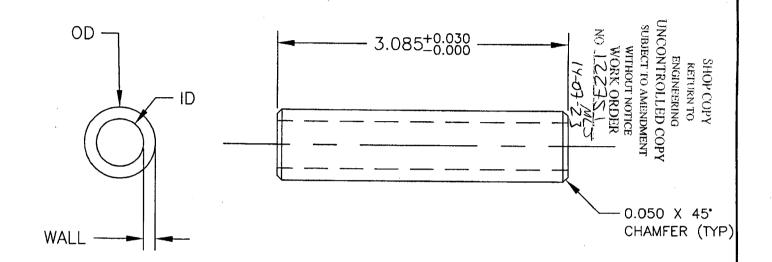
| Drawing Dimension | Tolerance | Actual Dimension | Accept | Reject | Method of Inspection | Comments |
|----------------------|-----------------|---------------------------------------|--------|--------|-------------------------|----------|
| 3.085 | +0.030/-0.000 | 3,100 | | | رىمىس | 21-4 |
| 0.080 | +/-0.010 | 0.076 | | | | |
| Ø0.591 | +0.008/-0.001 | 0.594 | | | | |
| 0.050 x 45° | +/-0.010 x 0.5° | 6-050 | | | | |
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| | DAS | | | | | |

| Measured by: | 9-89 | Audited by: | DAS 25 | Prototype Approval: | N/A |
|--------------|----------|-------------|-------------|---------------------|-----|
| Date: | 14.07.29 | Date: | 9-89 4-7-29 | Date: | N/A |

| Rev | Date | Change | Revised by Approved |
|-----|----------|-----------|---------------------|
| A | 06.10.27 | New Issue | KJ/JLM A |
| | | | () // // |



| DESIG | N PH | DRAWN BY | DART AEROSPACE U | SA, IN | IC. | |
|-------|---------|------------|-------------------|--------|--------------|-------------|
| CHEC | KED # | APPROVED 4 | D3490 | SHEET | REV. 1 OF | A 1 |
| DATE | | | TITLE | | SCAL | LE |
| 06.0 | 1.04 | | CROSS BOLT SPACER | | N | TS |
| Α | | 06.01.04 | NEW ISSUE | | | |



D3490-1/-3/-5 CROSS BOLT SPACER PARTS LIST

| PART NUMBER | OD | WALL | ID (REF) | MATERIAL SPEC |
|----------------|-------|-------|-------------|--------------------|
| D3490-1 | 0.500 | 0.049 | 0.402 | M6061T6T0.500W.049 |
| D3490-3 | 0.750 | 0.080 | 0.591 | M6061T6R0.750 |
| D3490-5 | 0.313 | 0.058 | 0.197 | M6061T6T0.313W.058 |

D3490-1/-3/-5 CROSS BOLT SPACER

- 1) ALUMINUM 6061-T6 (QQ-A-200/8 OR QQ-A-225/8) MATERIAL:
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED



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